

RECORD OF TELEPHONIC INTERVIEW

On June 6, 2006, Applicants' representative discussed the above-referenced Office Action with the Examiner and his Supervisor. The rejection under 103(a) was discussed. The Examiner's supervisor indicated that it was not clear that the Claims recited determination of a set of local maximum bounds from a global maximum bound. The Examiner's supervisor suggested an Amendment to recite "providing a global consumption maximum bound" in order to more clearly define the invention.

REMARKSRejections under 35 U.S.C. §102

The Examiner has rejected Claims 16-20 under 35 U.S.C. §102(b) as being anticipated by Faucher, et al. (U.S. 5,404,543) (U.S. ). Applicants respectfully disagree. Amended Claim 16 recites:

"A device controller for coupling a group of devices to one or more processors in a processing system, comprising:  
a command unit for sending commands to a said one or more devices;  
at least one control register for receiving a local maximum power consumption bound;  
a storage containing an access queue for each of said associated devices; and  
control logic coupled to said at least one control register and to said storage and including logic for determining quantities of accesses queued for each of said associated devices to predict a usage level, wherein said control logic is further coupled to an input of said command unit for sending power management commands consistent with maintaining a total power consumption of said group of devices below said local maximum bound and determined in conformity with said predicted usage level, whereby said device controller power manages said group of devices without intervention by said one or more processors."

[bold text added for emphasis]

Claim 16 has been amended to include features as recited in previous Claim 20 and to further point out details of the present invention. The Examiner, in the rejection of previous Claim 20, cites Faucher at col. 5 lines 13-32 as disclosing control logic that determines power management states of each particular device

in conformity with a number of accesses queued for each particular device. However, Faucher in the cited passage only discloses a memory controller that includes a buffer for commands and data, See Faucher at col. 7, lines 25-27, and that the commands and data can be stored in the buffer while a memory bank is being powered up. (See Faucher at col. 7, lines 27-32.) Faucher does not use the quantity of accesses queued in an access queue of a device controller to predict a usage level within said device controller and set power management commands thereby from the device controller's control logic. Faucher does not disclose a device controller control logic including logic for determining quantities of accesses queued for each of the associated devices to predict a usage level and further does not send power management commands determined in conformity with the predicted usage level determined from the quantities of accesses queued for each device.

Therefore, for all of the reasons stated above, Applicants believe that the rejection under 35 U.S.C. §102(b) has been overcome.

Rejections under 35 U.S.C. §103

The Examiner has rejected Claims 1-15 under 35 U.S.C. §103(a) as being unpatentable over Jeddeloh, et al. (U.S. 20040260957-A1) in view of Fung (U.S. 20020004913-A1) and in

further view of Adachi (U.S. 7,000,130-B2). Applicants respectfully disagree, but have amended the Claims to more particularly point out the features of the present invention, as suggested by the Examiners.

Claim 1 (and similarly independent Claim 8) recites:

A method of managing power in a processing system, comprising:

providing a single global maximum power consumption bound for a plurality of groups of devices within said processing system;

determining associated local maximum bounds of power consumption, one for each of said plurality of groups of devices, wherein a sum of said local bounds is less than a global maximum power consumption bound;

communicating each local maximum bound to an associated one of a plurality of local controllers coupled to said associated group of devices;

within each of said associated local controllers, second determining power management states for each device within each of said associated group of devices consistent with said associated local maximum bound, whereby said global maximum power consumption bound is met by meeting all of said local bounds; and

setting said power management state of each device in each of said plurality of groups from each of said associated local controllers.

[bold text added for emphasis]

As pointed out by the Examiner in the Office Action, Jeddeloh does not determine an associated local maximum bound of power consumption for each device and communicate each local bound to the associated local controller. The Examiner asserts that Jeddeloh meets a global maximum power consumption bound by meeting local bounds, citing paragraphs 28-29 of Jeddeloh.

However, the cited paragraphs only describe determining a level of local activity based on an activity threshold and not enforcement of a local bound at a local level. The power control in Jeddeloh is performed at a global level. (See e.g., id.)

The Examiner then cites Fung at paragraphs 106-108 as disclosing altering power states if thresholds within the system of Fung are crossed globally and locally. However, the cited paragraphs of Fung describe either global or local control of power management states, but not local control of power management states from a local bound communicated to the local device controller.

In the Examiner's arguments concerning the combination of Fung with Jeddeloh, he states that the motivation to combine these reference derives from the advantage that would be had in the system of Jeddeloh by incorporating the ability to alter thresholds dynamically and communicate them to the device controllers of Jeddeloh. Since, as pointed out above, Jeddeloh does not disclose enforcement of local power consumption bounds, and the portion of Fung cited by the Examiner as disclosing communication of "activity indicators" still only concerns the measure of power consumption and not the enforcement of local power consumption bounds nor communication of those bounds to individual local device controllers, Applicants believe the cited

combination of Fung with Jeddeloh would only provide information about local consumption and not local control in conformity with local bounds. The resultant combination would be a system in which the global control of Jeddeloh is performed in response to local activity of Jeddeloh or Fung, with the local activity thresholds being programmable as in Fung. Such a system does not enforce local maximums locally via commands sent from the local device controller to set power management states determined by the local device controller consistent with a local maximum bound that was communicated by the device controller.

Adachi, which was relied upon by the Examiner in the Office Action at page 6 as disclosing altering clocks of devices "such that the total of the local bounds (thresholds) is less than a global power consumption bound (measure of global activity) for the processing system" does not supply the missing elements.

Adachi, in the passages cited by the Examiner, See e.g. col. 9, lines 35-56, discloses that the activity of devices is measured locally, the local measures are then weighted and summed together. The resultant global activity (consumption) value is then compared to the global maximum.

Therefore, the operations of the systems of Jeddeloh, Fung and Adachi, as well as combination thereof, stand in contrast to that of the present invention, in which a provided global bound

is used to determine multiple local bounds that add to a number less than the global bound, with each local bound communicated to an associated device controller that enforces the local bound.

Therefore, for all of the reasons stated above, Applicants believe that the rejection under 35 U.S.C. §103(a) has been overcome.

Therefore, for all of the reasons stated above, applicants believe that all of the rejections and objections have been overcome.

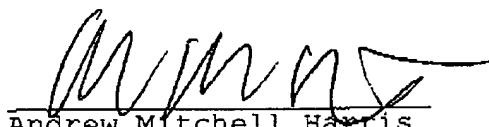
CONCLUSION

In conclusion, Applicants respectfully submit that this Amendment is fully responsive to all aspects of the objections and rejections tendered by the Examiner in the Office Action.

Applicants respectfully submit that they have persuasively demonstrated that the above-identified Patent Application, including Claims 1-20 are in condition for allowance, and such action is earnestly solicited.

No fees should be incurred by this Amendment, but if there are any fees incurred by this Amendment, please deduct them from IBM Deposit Account NO. 09-0447.

Respectfully Submitted,



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